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EXAMINER

STAICOVICI, STEFAN

ART UNIT PAPER NUMBER

1732

DATE MAILED: 03/12/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/851,242

Applicant(s)

RUNKLE ET AL.

Examiner

Stefan Staicovici

Art Unit

1732

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 6-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 16-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on December 23, 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicants' amendment filed December 23, 2002 (Paper No. 9) has been entered. The Declaration under 37 CFR 1.132 filed December 23, 2002 (Paper No. 8) has been entered.

No claims have been amended. No claims have been canceled. New claims 16-20 have been added. Claims 1-5 and 16-20 are pending in the instant application.

Election/Restrictions

2. Applicant's election of Group I in Paper No. 8 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 6-15 have been withdrawn from consideration without prejudice to filing one or more divisional applications.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 16, it is unclear to which 'potting material' Applicants are referring: the potting material used for potting the fabric and the tube together (first potting material) or the potting material used for potting the structure and the shell together (second potting material). It should be noted that for the purpose of examination it has been assumed that either potting material is being claimed. Further clarification is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-2 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Mancusi *et al.* (US Patent No. 5,186,832).

Mancusi *et al.* ('832) teach the claimed process of making a hollow fiber membrane separation device (contactor) including, providing a core, wrapping a hollow fiber fabric onto said core, potting the fabric and the core together to form an assembly, placing the assembly in a housing (shell) and potting the assembly and the housing interior to form a cartridge (see col. 8, lines 44-48, col. 9, lines 1-7 and 60-68 and col. 9, lines 41-60). Further, it should be noted that Mancusi *et al.* ('832) specifically teach potting of the tube-sheets to the interior of the housing (see col. 9, lines 22-27). Furthermore, Mancusi *et al.* ('832) teach that the potting between the

fabric and the core occurs by putting down continuous resinous potting material lines (bead-potting) (see col. 10, lines 45-50).

Regarding claim 19, Mancusi *et al.* ('832) specifically teach a hollow fiber membrane separation device (contactor). It is submitted that the assembly (structure) is centered in the housing (shell) in order for the resulting hollow fiber membrane separation device (contactor) to function as described.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3-5 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mancusi *et al.* (US Patent No. 5,186,832) in view of Bikson *et al.* (US Patent No. 4,800,019).

Mancusi *et al.* ('832) teach the basic claimed process as described above.

Regarding claims 3 and 20, Mancusi *et al.* ('832) does not teach mold-potting. Bikson *et al.* ('019) teach a process for forming a hollow fiber membrane contactor including, providing a mold, inserting the ends of a plurality of hollow fiber bundles into the mold and injecting a resinous material into the mold to form tubesheets that are integral with the housing. Therefore, it would have been obvious for one of ordinary skill in the art to have used mold potting as an alternative to gravity or centrifugal potting as taught by Bikson *et al.* ('019) in the process of

Mancusi *et al.* ('832) because, Bikson *et al.* ('019) teach that mold potting is one of many procedures available to one ordinarily skilled in the art and also because, both references teach similar products and processes and solve the similar problem of potting in a process of making a hollow fiber membrane separation device (contactor).

In regard to claims 4 and 5, Mancusi *et al.* ('832) does not teach a step of heat-treatment, specifically a first and a second heat-treatment. Bikson *et al.* ('019) teach a process for forming a hollow fiber membrane contactor including, a first step of heat-treating to cure the potting resin and then a second step of heat treatment (see col. 4, line 60 through col. 5, line 7). Therefore, it would have been obvious for one of ordinary skill in the art to have heat-treated the hollow fiber membrane contactor as taught by Bikson *et al.* ('019) in the process of Mancusi *et al.* ('832) because, Bikson *et al.* ('019) specifically teach that a two-step heat treatment process provides for an increased density of the porous walls of the hollow fibers, hence providing for an improved product (see col. 3, lines 27-42) also because, both references teach similar end-products.

9. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mancusi *et al.* (US Patent No. 5,186,832) in view of Caskey *et al.* (US Patent No. 4,961,760).

Mancusi *et al.* ('832) teach the basic claimed process as described above.

Regarding claims 16-18, although Mancusi *et al.* ('832) teach "resinous potting materials" (see col. 9, lines 10-12), Mancusi *et al.* ('832) do not teach specific materials. Caskey *et al.* ('760) teach a process for making a hollow fiber membrane separation device (contactor) including, using a variety of materials as potting materials such as: epoxy (thermoset),

polyurethane (thermoset and thermoplastic versions) and acrylic resins (thermoplastic). Therefore, it would have been obvious for one of ordinary skill in the art to have used a variety of potting materials such as, epoxy (thermoset), polyurethane (thermoset and thermoplastic versions) and acrylic resins (thermoplastic) as taught by Caskey *et al.* ('760) in the process of Mancusi *et al.* ('832) because, Mancusi *et al.* ('832) specifically teach "resinous potting materials" (see col. 9, lines 10-12) and also because both references teach a hollow fiber membrane separation device (contactor), hence a similar end-product.

10. Claims 1-2, 16 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang *et al.* (US Patent No. 5,284,584) in view of Mancusi *et al.* (US Patent No. 5,186,832) or Caskey *et al.* (US Patent No. 4,961,760).

Huang *et al.* ('584) teach the basic claimed process for making a hollow fiber membrane separation device (contactor) including, providing a core, wrapping a hollow fiber fabric onto said core and potting the fabric and the core together to form an assembly (see col. 15, line 57 through col. 16, line 26). Further, Huang *et al.* ('584) teach bead-potting (see Figure 1).

Regarding claims 1 and 2, Huang *et al.* ('584) do not teach forming a cartridge. Mancusi *et al.* ('832) teach a process for making a hollow fiber membrane separation device (contactor) including, providing a core, wrapping a hollow fiber fabric onto said core, potting the fabric and the core together to form an assembly, placing the assembly in a housing (shell) and potting the assembly and the housing interior to form a cartridge (see col. 8, lines 44-48, col. 9, lines 1-7 and 60-68 and col. 9, lines 41-60). Further, it should be noted that Mancusi *et al.* ('832) specifically teach potting of the tubesheets to the interior of the housing (see col. 9, lines 22-27).

Furthermore, Mancusi *et al.* ('832) teach that the potting between the fabric and the core occurs by putting down continuous resinous potting material lines (bead-potting) (see col. 10, lines 45-50). Caskey *et al.* ('760) teach a process for making a hollow fiber membrane separation device (contactor) including, inserting hollow fiber membrane into a casing and potting the hollow fiber membrane and the casing using an adhesive (see col. 9, lines 40-47). Therefore, it would have been obvious for one of ordinary skill to have inserted a hollow fiber membrane device into a casing and potted said hollow fiber membrane device to said casing as taught by Mancusi *et al.* ('832) or Caskey *et al.* ('760) in the process of Huang *et al.* ('584) because, Huang *et al.* ('584) specifically teach a hollow fiber membrane fabric used in separation devices, whereas Mancusi *et al.* ('832) or Caskey *et al.* ('760) teach hollow fiber membrane separation devices and as such, the hollow fiber membrane fabric of Huang *et al.* ('584) requires to be inserted into a casing and potted to said casing as taught by Mancusi *et al.* ('832) or Caskey *et al.* ('760) in order to function as described.

Regarding claims 16 and 18, Huang *et al.* ('584) teach a thermoplastic polyolefin as a potting material (see col. 11, lines 32-47).

In regard to claim 19, Huang *et al.* ('584) specifically teach a hollow fiber membrane fabric used in separation devices, whereas Mancusi *et al.* ('832) or Caskey *et al.* ('760) teach hollow fiber membrane separation devices. It is submitted that the assembly (structure) is centered in the housing (shell) in order for the resulting hollow fiber membrane separation device (contactor) to function as described.

11. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang *et al.* (US Patent No. 5,284,584) in view of Mancusi *et al.* (US Patent No. 5,186,832) or Caskey *et al.* (US Patent No. 4,961,760) and in further view of Bikson *et al.* (US Patent No. 4,800,019).

Huang *et al.* ('584) in view of Mancusi *et al.* ('832) or Caskey *et al.* ('760) teach the basic claimed process as described above.

Regarding claim 3, Huang *et al.* ('584) in view of Mancusi *et al.* ('832) or Caskey *et al.* ('760) do not teach mold-potting. Bikson *et al.* ('019) teach a process for forming a hollow fiber membrane contactor including, providing a mold, inserting the ends of a plurality of hollow fiber bundles into the mold and injecting a resinous material into the mold to form tube-sheets that are integral with the housing. Therefore, it would have been obvious for one of ordinary skill in the art to have used mold potting as an alternative to gravity or centrifugal potting as taught by Bikson *et al.* ('019) in the process of Huang *et al.* ('584) in view of Mancusi *et al.* ('832) or Caskey *et al.* ('760) because, Bikson *et al.* ('019) teach that mold potting is one of many procedures available to one ordinarily skilled in the art and also because, both references teach similar products and processes and solve the similar problem of potting in a process of making a hollow fiber membrane separation device (contactor).

In regard to claims 4 and 5, Huang *et al.* ('584) in view of Mancusi *et al.* ('832) or Caskey *et al.* ('760) do not teach a step of heat-treatment, specifically a first and a second heat-treatment. Bikson *et al.* ('019) teach a process for forming a hollow fiber membrane contactor including, a first step of heat-treating to cure the potting resin and then a second step of heat treatment (see col. 4, line 60 through col. 5, line 7). Therefore, it would have been obvious for

one of ordinary skill in the art to have heat-treated the hollow fiber membrane contactor as taught by Bikson *et al.* ('019) in the process of Huang *et al.* ('584) in view of Mancusi *et al.* ('832) or Caskey *et al.* ('760) because, Bikson *et al.* ('019) specifically teach that a two-step heat treatment process provides for increased density of the porous walls of the hollow fibers, hence providing for an improved product (see col. 3, lines 27-42) also because, both references teach similar end-products.

Response to Arguments

12. Applicants' remarks filed December 23, 2002 (Paper No. 9) have been considered.

The Declaration under 37 CFR 1.132 ("Declaration") filed December 23, 2002 (Paper No. 8) has been considered and is insufficient to overcome the rejections based upon Mancusi *et al.* ('832) and Huang *et al.* ('584) as set forth in the last Office action.

Specifically, Applicants argue in paragraphs 5-10 of the Declaration filed December 23, 2002 and on pages 3-4 of the amendment filed December 23, 2002, that Mancusi *et al.* ('832) "does not refer to 'potting the structure and the shell together,'" but to the "use of O-rings to form a seal." However, in col. 10, lines 50-60, Mancusi *et al.* ('832) specifically teach that the "bundle ends can be *sealed to the housing interior* as needed, by simply *applying an appropriate amount of resinous potting material* to the edge adjacent the bundle ends" and that *alternatively* a ring shaped fitting may be used (emphasis added). Hence, it is submitted that Mancusi *et al.* ('832) specifically teach potting of the tube-sheets to the interior of the housing.

Further, Applicants argue in paragraph 11 of the Declaration filed December 23, 2002 and on pages 4-5 of the amendment filed December 23, 2002, that Huang *et al.* ('584) teach that "'sealing' refers to O-rings." However, the teaching of Huang *et al.* ('584) were used to show a process of making a hollow fiber membrane separation device (contactor) including bead-potting the fabric and the core together to form an assembly (see col. 15, line 57 through col. 16, line 26). Furthermore, it should be noted that the teachings of Mancusi *et al.* ('832) were used to show that the "bundle ends can be *sealed to the housing interior* as needed, by simply *applying an appropriate amount of resinous potting material* to the edge adjacent the bundle ends" and that *alternatively* a ring shaped fitting may be used (emphasis added).

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (703) 305-0396. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM and alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard D. Crispino, can be reached at (703) 308-3853. The fax phone number for this Group is (703) 305-7718.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Stefan Staicovici, PhD


Primary Examiner

3/8/03

AU 1732

March 8, 2003